PATENT SPECIFICATION

359,019

Application Date: July 14, 1930. No. 21,266/30.

Complete Left: April 7, 1931.

Complete Accepted: Oct. 14, 1931.

PROVISIONAL SPECIFICATION.

Improvements in Carburettors for Internal Combustion Engines.

We, WILLIAM HASLAM MANNERS, of 26, Dingaan Street, Krugersdorp, Transvaal Province, Union of South Africa, a British subject, NORRIS BARKER, of 7, Trust Buildings, Fox Street, Johannesburg, Transvaal Province, aforesaid, a British subject, and M. & S. CARBURETTOR MANUFACTURING AND FINANCE CORPORATION, LIMITED, a company registered in the Union of South Africa, and whose registered office is at 39—40 Beresford House, 86, Main Street, Johannesburg, aforesaid, do hereby declare the nature of this invention to be as follows:—

This invention relates to carburettors for internal combustion engines and has reference to the type of carburettor in which a portion of the petrol or liquid fuel supply passage is provided by a tube having a fine or narrow slit or slot through which the fuel passes before mixing with the air to form the explosive mixture, and in which a member is rotatably arranged in said tube and has a bevelled end, the edge of which serves for controlling the supply of the fuel by co-acting with the narrow slit or slot to control the effective length thereof.

The object of the present invention is to improve the construction and arrangement of the carburettor in order, inter alia, to render possible a finer or more sensitive adjustment of the elements which control the supply of the liquid fuel, the parts which control the supply of air, and the parts which control the supply of the explosive mixture, or the mixture of fuel and air, to the engine cylinders. The liquid fuel supply controlling elements are so designed that for equal angular movements of the rotary member or valve, equal portions of the length of the narrow slit or slot are opened or closed.

According to the present improvements the valve, or that element which controls the supply of the liquid fuel, is fashioned or shaped, in one form, with a helical edge which co-acts with the narrow slit or slot in the tube, in which it is operatively arranged, to regulate the effective length of the latter. The valve is split for a portion of its length, including the portion on which the helical edge is formed, so as to ensure its tightly fitting the tubular housing, and is constructed so as to extend below the slit or slot and provided with means for promoting the flow of the liquid fuel up the passage provided by the valve to the slit or slot in the valve housing.

The valve is combined with screw adjusting means carried by an arm operating the valve, for setting the helical edge in the requisite operative position relative to the slit or slot, and with screw adjusting means which are adapted to be operated from the dashboard of the vehicle for adjusting the valve controlling means to vary the position of the helical edge relative to the slit or slot, and by varying the effective length of the latter to ensure a richer or poorer explosive mixture being supplied to the engine cylinders.

The air admission valve has screw adjusting means combined with its operating lever so that it can be set or adjusted as required to vary the volume of air which is admitted to the carburettor.

The levers or arms controlling the supply of fuel, and the supply of air, and the supply of explosive mixture to the engine cylinders, are connected through the medium of a rod or link which carries the screw adjusting means for the fuel supply valve.

The lever or arm controlling the supply of the explosive mixture co-operates with adjustable and fixed stops for limiting its movement in both directions, and through it the movement of the link and levers controlling the fuel and air supply valves.

The body of the carburettor in proximity to the elements of the fuel supply valve is enlarged in cross-sectional area, so that the tubular housing for the valve does not constrict the passage for the air. The body may be adapted to either up-draught or down-draught types of carburettors.

The rotary air admission valve and the rotary explosive mixture admission valve are made of such internal contour or shape as not to impede the flow of the air and explosive mixture through the carburettor to the induction pipe.

In an alternative form of the invention the narrow slit or slot may be formed in

the valve housing at right angles to the centre line thereof, and the portion of the valve which co-acts with it be constructed of hemi-cylindrical shape, the valve being split for a portion of its length to ensure its tightly fitting the housing.

In one embodiment of the invention the body of the carburettor on the one side has bolted to it a cylindrical extension piece which constitutes the air inlet into the body. The body at the other end and at the opposite side has bolted to it the induction pipe or a pipe leading thereto for conducting the explosive mixture to the manifold engine. The body portion, centrally of its length, is constructed at the top with a hollow cylindrical projection or boss which communicates with the interior of said body, and at the bottom with an interiorly screw-threaded cylindrical projection or boss.

The elements of the liquid fuel supply controlling means include an outer tubular part or casing, the upper end of which fits in the top boss on the body, and the lower portion of which passes through a hole in the body; it being flanged at the lower end and seated in the screw-threaded hole in the bottom boss on the body, and held in position therein by means of a hollow nut or screw-threaded plug. The narrow slit or slot is formed in the tubular part or casing, and the liquid fuel or petrol passes therethrough into the body and is directed towards the explosive mixture outlet or induction pipe. The valve or other element of the liquid fuel controlling means, which is rotatably arranged in the tubular part or casing, comprises two main parts. The one part is hollow for a portion of its length and is constructed to provide the helical edge which co-acts with the slit or slot to regulate the effective length thereof. This may be constructed by boring the part from the one end for a suitable distance, then counterboring it to a suitable point and forming the helical edge by cutting away part of one half of the counterbored portion from the inner end of the counterbore to a suitable point, and forming a fine cut or slot longitudinally and diametrically of this part of the valve from the inner end of the helical edge to the end of the bore. The other part of the valve is in the form of a pin made for a portion of its length of a diameter to fit the bore, and for the remaining portion of its length of a diameter to fit the counterbore. The pin is fixed in the split portion of the hollow part of the valve to one side thereof by means of a small pin. By cutting away the portion of the hollow part of the valve to form the helical edge, a passage is provided for the liquid fuel between the pin and the tubular part or casing to the back of the narrow slit or slot in the latter, and by prolonging the two parts of the valve below the bottom end of the fine or narrow slit or slot, the flow of the petrol up the passage to the slit or slot is provided by capillary attraction. By splitting the hollow part of the valve it ensures its tightly fitting the tube or casing, whilst allowing of its free rotation therein to regulate the fuel supply.

The petrol from the float feed chamber passes along a passage into the screw-threaded hole in the bottom boss on the body, below the lower end of the hollow plug. The petrol then passes or is drawn through the plug into the lower end of the tube or casing, thence passing by the passage between the pin and casing to the narrow slit or slot.

A screwed cap is screwed into and closes the opening in the lower end of the bottom boss on the body, a washer being provided for making a joint between the cap and the boss.

The means for rotating the valve elements includes a flanged bush which is fixed to the upper end of the hollow element by a pin. The flange of the bush is fashioned with a projection. The operating lever for the petrol supply valve at its one end is adjustably mounted around the bush at the top of the body, between the upper end of the boss and the flange of the bush. This lever is constructed with two lugs or projections which carry set-screws, which, at their inner ends engage with opposite sides of the projections. The set-screws allow for any desired setting of the lever relative to the helical edge of the hollow part of the valve. The end of the lever which is secured around the bush is split or is in the form of a clamp so that it can be secured around the bush by a set-screw, after requisite adjustment of the lever has been effected.

The petrol supply valve lever is constructed with a longitudinal slot for adjustably connecting thereto means for adjusting the extent of the angular or rotary movement of the valve elements, in order to vary, as desired, the length of the helical edge which co-acts with the slit or slot.

A link or rod is provided which serves for connecting the petrol supply valve operating lever with the levers—hereinafter referred to—which operate the valve which controls the admission of air to the carburettor and the valve which controls the volume of the explosive mixture which passes from the carburettor to the engine. This link is constructed at the center of

its length with integral projecting parts which are angularly disposed relative to the sides of the link. These parts provide between their sides an angular slot or opening in the ends of which is journalled a screw. A retaining collar is fixed on one end of the screw. The screw is constructed at its other and outer end with a head or enlargement, and beyond the enlargement it is squared to fit into a coupling piece to which it is pinned. The screw is rotated in either direction by means of a flexible rod or wire which normally will be extended to the dashboard so that it can be operated by the driver of the vehicle from his seat. On the screw is mounted a nut. This nut is constructed on the upper side with projections which are adapted to slide on the sides of the parts of the link which, between them, form the slot. The nut carries a pin which slidingly engages in the slot in the petrol supply controlling lever. When the flexible rod or wire is rotated in one direction, the screw traverses the nut so that the pin moves the lever into the desired position either to increase or decrease—according to the direction of rotation of the screw—the angular movement of said lever, and through it the valve elements, and so increase or decrease the effective length of the narrow slot or slit; by this means increasing or decreasing the quantity of petrol which is permitted to pass through the slit or slot. In this way the helical edge, by co-operating with a greater or lesser portion of the length of said slit or slot, determines the quantity of the petrol passing therethrough and commingling with the air to form the explosive mixture.

The rotary air admission valve is operatively housed in the body above the air inlet branch. Interiorly this valve is curved or rounded so as to deflect or divert the air stream in the direction of and past the petrol supply valve tube or casing. This internal curvature has the effect of preventing undue impediment of the air stream. The air valve is constructed with a stem or spindle which passes through an aperture in a cover fixed to the body. On the upper end of the stem or spindle is adjustably secured one end of the operating lever for the air control valve, the one end of which lever is split so that it can be clamped around the stem or spindle by a set-screw. A collar is fixed on the stem or spindle above the end of the control lever. This collar is constructed with a T-shaped arm or projection, having depending portions or lugs at its ends on the underside. Set-screws are screwed through holes in the lugs into engagement with the sides of the air control lever. These screws provide for fine adjustment of the air admission valve relative to its lever, after which the lever is secured to the spindle or stem of the valve by tightening its set-screw. The other end of the lever is attached to one end of the rod or link which connects the operating levers by a pin.

In the extension piece at the air admission side of the body a strangler valve is operatively arranged for the purpose of regulating the air supply to the air valve for starting purposes. The strangler valve is mounted on a spindle journalled at its ends in the extension piece. It has attached to its one extremity a lever which is adapted to be operated through a flexible rod or wire movable in a flexible casing, one end of which is fixed in a clamp to the cover on the body above the air valve housing. The flexible wire and casing are carried to a convenient point on the dashboard so that the wire can be operated by the driver of the vehicle to regulate the strangler valve independently of the operating means for the petrol supply valve, and the air and explosive mixture supply valves.

The rotary explosive mixture admission valve is housed in the other end of the body and is constructed similar to the air admission valve in that it is rounded or curved interiorly so as to deflect the explosive mixture in the direction of the induction pipe. The stem of this valve projects through an aperture in a cover which is fixed to the body. The lever for operating this valve is similar to the lever of the air admission valve. It is clamped around the valve stem at one end and at the other end is connected to the link which connects the operating levers, by means of a rod or pin. The link is operated through the medium of the explosive mixture valve lever so that the petrol supply valve, the air admission valve and the valve which controls the supply of the explosive mixture are all operated by a single control fixed say on the dashboard of the vehicle, which control includes a suitably shaped lever clamped at one end to the end of the stem of the explosive mixture valve below the lever, and a rod fixed to the other end of the shaped lever by a screwed pin.

For the purpose of limiting the movement of the explosive mixture admission valve lever in the one direction a pin or projection is provided on the cover on the valve housing, and an adjustable stop is provided for limiting the movement of the lever in the opposite direction. The adjustable stop comprises a pin split for a portion of its length and threaded to receive an adjustable screw stop which is

screwed into a hole in the pin in the plane of the split. A screw is provided for locking the adjusting screw in position after adjustment, by forcing the split portions of the pin together.

The body of the carburettor between the air and explosive mixture valves is constructed so that the passage therethrough tapers from the centre in the direction of the valves. By thus increasing the cross-sectional area of the passage the width thereof at the sides of the petrol supply valve casing is the same or substantially the same as the width of the passages communicating with the valve housings for the air and explosive mixture valves. This obviates any constriction of the passage and allows of the free or unimpeded flow of the air past the tubular valve casing.

In the operation of the carburettor the petrol supply valve, the air admission valve and the explosive mixture supply valve are each set to ensure a supply of the best explosive mixture under normal running conditions of the engine. The petrol supply is increased or decreased as required by varying the extent of the angular movement of the lever controlling the petrol supply valve, and so increasing or decreasing the effective length of the narrow slot or slit, or that portion of the slot or slit with which the helical edge of the valve co-operates.

In the modified form of the valve device for controlling the supply of petrol, the tubular member or casing is constructed with a horizontal arcuate slot or slit, or a slot or slit at right angles to the longitudinal axis of the tubular casing. The valve member is split for a portion of its length and one half of the split portion is cut away. In the operation of this construction one of the edges of the split portion acts when the valve member is partially rotated gradually to reduce the effective length of the slit or slot and so determines the quantity of petrol that is able to pass therethrough. The splitting of the valve member ensures the same tightly fitting in the bore of the tubular casing. This form of the valve device can be operated by the means above described.

The body of the carburettor may be adapted to two types of up draught, the one in which the air inlet branch is positioned as before described, and the other in which the air inlet is positioned at the other and upper side of the body; or the body may be adapted to two types of down draught, the one in which the air inlet branch is positioned at the top of the body, and the explosive mixture outlet or induction pipe at the bottom of the other end of the body, and the other in which the air inlet branch is positioned at the bottom of the body and the explosive mixture outlet or induction pipe at the bottom of the other end of the body.

Dated this 14th day of July, 1930.

WHEATLEY & MACKENZIE,
40, Chancery Lane, London, W.C.2,
Agents.

COMPLETE SPECIFICATION.

Improvements in Carburettors for Internal Combustion Engines.

We, WILLIAM HASLAM MANNERS, of 26, Dingaan Street, Krugersdorp, Transvaal Province, Union of South Africa, a British subject, NORRIS BARKER, of 7, Trust Buildings, Fox Street, Johannesburg, Transvaal Province, aforesaid, a British subject, and M. & S. CARBURETTOR MANUFACTURING AND FINANCE CORPORATION, LIMITED, a company registered in the Union of South Africa, and whose registered office is at 39—40, Beresford House, 86, Main Street, Johannesburg, aforesaid, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to carburettors for internal combustion engines and refers particularly to such carburettors of the kind wherein the liquid fuel is delivered to the air to be carburetted by a tubular member which extends diametrically of the air stream and has in its wall a fine or narrow slit or slot through which the fuel escapes before mixing with the air to form a combustible mixture, the tube containing within it a rotary member one edge of which co-acts with the narrow slit or slot in controlling the effective length thereof open to the passage of fuel.

The object of the present invention is to improve the construction and arrangement of the carburettor in order, inter alia, to render possible a finer or more sensitive adjustment of the elements which control the supply of liquid fuel, the parts which control the supply of air, and the parts which control the supply of the explosive mixture, or the mixture of fuel and air, to the engine cylinders.

According to the present improvements the liquid fuel supply controlling elements in a carburettor of the kind set forth are so designed that for equal angular movements of the rotary member or valve, equal

portions of the length of the narrow slit or slot are opened or closed. The fuel valve, or that element which controls the supply of the liquid fuel, which in one form is fashioned or shaped with a helical edge which co-acts with the narrow slit or slot in the tube to regulate the effective length of the opening is split for a portion of its length, including the portion on which the helical edge is formed, so as to ensure its tightly fitting the tubular housing, and is constructed so as to extend below the slit or slot and provided with means for promoting the flow of the liquid fuel up the passage provided by the valve to the slit or slot in the valve housing.

The valve is combined with screw adjusting means carried by the arm operating the valve, for setting the helical edge in the requisite operative position relative to the slit or slot, and with screw adjusting means which are adapted to be operated from the dashboard of the vehicle for adjusting the valve controlling means to vary the position of the helical edge relative to the slit or slot, and by varying the effective length of the latter to ensure a richer or poorer explosive mixture being supplied to the engine cylinders.

The air admission valve has screw adjusting means combined with its operating lever so that it can be set or adjusted as required to vary the volume of air which is admitted to the carburettor.

The levers or arms controlling the supply of fuel, and the supply of air, and the suppy of explosive mixture to the engine cylinders, are connected through the medium of a rod or link which carries the screw adjusting means for the fuel supply valve.

The lever or arm controlling the supply of the explosive mixture co-operates with adjustable and fixed stops for limiting its movement in both directions, and through it the movement of the link and levers controlling the fuel and air supply valves.

The body of the carburettor in proximity to the elements of the fuel supply valve is enlarged in cross-sectional area, so that the tubular housing for the valve does not constrict the passage for the air. The body may be adapted to either up-draught or down-draught types of carburettors.

The rotary air admission valve and the rotary explosive mixture admission valve are made of such internal contour or shape as not to impede the flow of the air and explosive mixture through the carburettor to the induction pipe.

In an alternative form of the invention the narrow slit or slot may be formed in the valve housing at right angles to the centre line thereof, and the portion of the valve which co-acts with it be constructed of hemi-cylindrical shape, the valve being split for a portion of its length to ensure its tightly fitting the housing.

The invention will now be more fully explained with the aid of the accompanying drawings, in which

Fig. 1 is a part-sectional elevation of one embodiment of the improved carburettor.

Fig. 2 is a part-sectional plan of the same, the plane of section being indicated by the dotted line x—x in Fig. 1.

Fig. 3 is an elevation of the carburettor.

Figs. 4 and 5 are diagrammatic views illustrating the adaptation of the carburettor to embody different types of up and down draught.

Fig. 6 is an elevation of the valve shown in Fig. 1.

Fig. 7 is an elevation of the valve housing shown in Fig. 1.

Fig. 8 is an elevation of the alternative type of valve housing, and

Fig. 9 is a sectional elevation of the valve housing shown in Fig. 8, the alternative form of valve being shown in position therein in elevation.

Referring to the embodiment of the invention illustrated in Figs. 1, 2, 3, 6 and 7, the numeral 1 in Figs. 1 to 3 denotes the body of the carburettor, which on the one side has bolted to it a cylindrical extension piece 2 which constitutes the air inlet into the body 1. The body 1 at the other end and at the opposite side has bolted to it the induction pipe 3, or a pipe leading thereto for conducting the explosive mixture to the manifold for leading it to the cylinders of the engine. The body portion 1, centrally of its length, is constructed at the top with a hollow cylindrical projection or boss 4, which communicates with the interior of said body, and at the bottom with an interiorly screw-threaded cylindrical projection or boss 5.

The elements of the liquid fuel supply controlling means include the outer tubular part or casing 6, the upper end of which fits in the boss 4 and the lower portion of which passes through a hole in the body; it being flanged at the lower end and seated in the screw-threaded hole in the boss 5, and held in position therein by means of a hollow nut or screw-threaded plug 7. 8 is the narrow slit or slot in the part or casing 6—see Figs. 1 and 7—through which slit or slot 8 the liquid fuel or petrol passes into the body 1, and by which it is directed towards the explosive mixture outlet or induction pipe 3. The valve or other element of the liquid fuel controlling means, which is rotatably arranged in the part or casing 6, comprises two main parts 9, 10, as shown in Figs. 1 and 6. The one part 9 is hollow for a

portion of its length and is constructed to provide the helical edge 11 which co-acts with the slit or slot 8 to regulate the effective length thereof. This may be constructed by boring the part 9 from the one end to a point 12, then counterboring it to a point 13, and forming the helical edge 11 by cutting away part of one half of the counterbored portion from the inner end of the counterbore to a point 14, and forming a fine cut or slot 15 longitudinally and diametrically of the part 9 from the inner end of the helical edge to the end of the bore 12. The other part 10 of the valve is in the form of a pin made for a portion of its length of a diameter to fit the bore 12, and for the remaining portion of its length of a diameter to fit the counterbore 13. The pin 10 is fixed in the split portion of the part 9 of the valve to one side thereof by means of a small pin 16. By cutting away a portion of the part 9 of the valve to form the helical edge 11 a passage 17 is provided for the liquid fuel between the parts 6 and 10 to the back of the narrow slit or slot 8 in the part or casing 6, and by prolonging the parts 9, 10, of the valve below the bottom end of the fine or narrow slit or slot 8 the flow of the petrol up the passage 17 to the slit or slot 8 is promoted by capillary attraction. By splitting the part 9 it ensures its tightly fitting the tube or casing 6 whilst allowing of its free rotation therein to regulate the fuel supply.

The petrol from the float feed chamber 18 passes along the passage 19 into the screw-threaded hole 20 in the boss 5, below the lower end of the plug 7. The petrol then passes or is drawn through the plug 7 into the lower end of the tube or casing 6, thence by the passage 17 to the narrow slit or slot 8.

21 is a screwed cap screwed into and closing the opening in the lower end of the boss 5; 22 being a washer for making a fluid-tight joint between the cap 21 and the boss 5.

The means for rotating the valve elements 9, 10, includes a flanged bush 23 which is fixed to the upper end of the element 9 by a pin 24. The flange of the bush 23 is fashioned with a projection 25. 26 is the operating lever for the petrol supply valve, which lever at its one end is adjustably mounted around the bush 23 between the upper end of the boss 4 and the flange of the bush 23. The lever 26 is constructed with two lugs or projections 27 which carry set-screws 28, which, at their inner ends, engage with opposite sides of the projection 25. The set-screws 28 allow for any desired setting of the lever 26 relative to the helical edge 11. The end of the lever 26 which is secured around the bush 23 is shown split or in the form of a clamp, so that it can be secured around the bush 23 by the set-screw 29, after requisite adjustment of the lever 26 has been effected.

The lever 26 is constructed with a longitudinal slot 30 for adjustably connecting thereto means for adjusting the extent of the angular or rotary movement of the valve elements 9, 10, in order to vary, as desired, the length of the helical edge 11 which co-acts with the slit or slot 8.

31 is a link which serves for connecting the operating lever 26 with the levers—hereinafter referred to—which operate the valve which controls the admission of air to the carburettor and the valve which controls the volume of the explosive mixture which passes from the carburettor to the engine. The link 31 is constructed at the centre of its length with integral projecting parts 32 which are angularly disposed relative to the sides of the link. These parts 32 provide between their sides an angular slot or opening 33 in the ends of which is journalled a screw 34. 35 is a retaining collar on the one end of the screw 34. The screw 34 is constructed at its other and outer end with a head or enlargement 36, and beyond the enlargement 36 it is shown squared to fit into a coupling piece 37 to which it is pinned. The screw 34 is rotated in either direction by means of a flexible rod or wire 38 which normally will be extended to the dashboard so that it can be operated by the driver of the vehicle from his seat. On the screw 34 is mounted a nut 39. This nut is constructed on the upper side with projections 40 which are adapted to slide on the sides of the parts 32 of the link 31, which parts 32, between them, form the slot 33. The nut 39 carries a pin 41 which slidably engages in the slot 30 in lever 26. When the flexible rod or wire 38 is rotated in one direction, the screw 34 traverses the nut 39 so that the pin 41 moves the lever 26 into the desired position either to increase or decrease—according to the direction of rotation of the screw 34—the angular movement of said lever, and through it the valve elements 9, 10, and so increase or decrease the effective length of the narrow slit or slot 8; by this means increasing or decreasing the quantity of petrol which is permitted to pass through the slit or slot 8. In this way the helical edge 11, by co-operating with a greater or lesser portion of the length of said slit or slot 8, determines the quantity of the petrol passing therethrough and commingling with the air to form the explosive mixture.

The rotary air admission valve 42 is operatively housed in the body 1 above the

air inlet branch 2. Interiorly the valve 42 is curved or rounded, as shown at 43, in Fig. 1, so as to deflect or divert the air stream in the direction of and past the petrol supply valve tube or casing 6. This internal curvature 43 has the effect of preventing undue impediment of the air stream. The valve 42 is constructed with a stem or spindle 44 which passes through an aperture in a cover 44a fixed to the body 1. On the upper end of the stem or spindle 44 is adjustably secured one end of the operating lever 45 for the air control valve 42, the one end of which lever 45 is split so that it can be clamped around the stem or spindle 44 by a set-screw 46. 47 is a collar fixed on the stem or spindle 44 above the end of lever 45. The collar 47 is constructed with a T-shaped arm or projection 48, having depending portions or lugs 49 at its ends on the underside. 50 are set-screws which are screwed through holes in the lugs 49 into engagement with the sides of the lever 45. The screws 50 provide for fine adjustment of the air admission valve 42 relative to the lever 45, after which the lever 45 is secured to the stem or spindle 44 of the valve by tightening the set-screw 46. The other end of the lever 45 is attached to one end of the rod or link 31 by pin 51.

In the extension piece 2 a strangler valve 52 is operatively arranged for the purpose of regulating the air supply to the valve 42 for starting purposes. The valve 52 is mounted on a spindle 53 journalled at its ends in the extension piece 2. It has attached to its one extremity a lever 54 which is adapted to be operated through a flexible rod or wire 55, movable in a flexible casing 56, one end of which is fixed in a clamp 57 to the cover 44a. The flexible wire 55 (in its casing 56) is carried to a convenient point on the dashboard so that it can be operated by the driver of the vehicle to regulate the valve 52 independently of the operating means for the petrol supply valve, and the air and explosive mixture supply valves.

The rotary explosive mixture admission valve 58 is housed in the other end of the body 1 and is constructed similar to the valve 42 in that it is rounded or curved interiorly, as indicated at 59, so as to deflect the explosive mixture in the direction of the pipe 3. The stem 60 of the valve 38 projects through an aperture in the cover 61 which is fixed to the body 1. The lever 62 for operating the valve 58 is similar to the lever 45 of the air admission valve 42. It is clamped around the stem 60 at one end, as indicated at 63, and at the other end is connected to the link 31 by means of the rod or pin 64. The link 31 is operated through the medium of the lever 62 so that the petrol supply valve, the air admission valve 42, and the valve 58 which controls the supply of the explosive mixture are all operated by a single control, fixed say on the dashboard of the vehicle, which control includes a suitably shaped lever 65 clamped at one end to the end of the stem 60 below the lever 62, and a rod 66 fixed to the other end of the lever 65 by a screwed pin 67.

For the purpose of limiting the movement of the lever 62 in the one direction a pin or projection 68 is provided on the cover 61, and an adjustable stop is provided for limiting the movement of the lever 62 in the opposite direction. The adjustable stop is shown comprising a pin 69 split for a portion of its length and threaded to receive an adjustable screw stop 70 which is screwed into a hole in the pin 69 in the plane of the split. 71 is a screw for locking the screw 70 in position after adjustment, by forcing the split portions of the pin 69 together.

The body 1 of the carburettor between the valves 42 and 58 is constructed so that the passage 72 therethrough tapers from the centre in the direction of the valves 42 and 58. By thus increasing the cross-sectional area of the passage 72, the width thereof at the sides of the petrol supply valve casing 6 is the same or substantially the same as the width of the passages communicating with the valve housings for the air and explosive mixture valves. This obviates any constriction of the passage 72 and allows of the free or unimpeded flow of the air past the tubular casing 6.

In the operation of the carburettor the petrol supply valve, the air admission valve 42 and the explosive mixture supply valve 58 are each set to ensure a supply of the best explosive mixture under normal running conditions of the engine. The petrol supply is increased or decreased as required by varying the extent of the angular movement of the lever 26, and so increasing or decreasing the effective length of the narrow slot or slit 8, or that portion of the slot or slit with which the helical edge 11 co-operates.

In the modified form of the valve device for controlling the supply of petrol, illustrated in Figs. 8 and 9, the tubular member or casing 73 is constructed with a horizontal arcuate slot or slit 74, or a slit or slot at right angles to the longitudinal axis of the tubular casing 73. The valve member 75 is split for a portion of its length from the inner end to a point 76, and one half of the split portion is cut away from the inner end to the point 77. In the operation of this construction one

of the edges 78 of the split portion acts when the valve member 75 is partially rotated gradually to reduce the effective length of the slit or slot 74, and so determine the quantity of petrol that is able to pass therethrough. The splitting of the valve member 75 from the point 77 to the point 76 ensures the same tightly fitting in the bore of the tubular casing 73. This form of the valve device can be operated by the means shown and described in connection with Figs. 1 to 3 of the drawings.

As illustrated in Fig. 4, the body 1 of the carburettor may be adapted to two types of up draught, the one in which the air inlet branch is positioned as shown in Figs. 1 and 3, and in full lines in Fig. 4, in which the arrow in full lines indicates the direction of flow through the carburettor, and the other in which the air inlet is positioned at the other and upper side of the body 1, as indicated by the dotted lines, the dotted arrow indicating the direction of the air flow.

In Fig. 5 the body 1 of the carburettor is adapted to two types of down draught, the one in which the air inlet branch 2 is positioned at the top of the body, and the explosive mixture outlet or induction pipe 3 at the bottom of the other end of the body, in which the arrow in full lines indicates the direction of flow through the carburettor, and the other in which, as shown in dotted lines, the air inlet branch is positioned at the bottom of the body and the direction of the air flow is indicated by the dotted arrow.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A carburettor for internal combustion engines, of the kind having means for controlling the supply of liquid fuel comprising a tubular fuel supply member extending diametrically of the air stream and having a narrow slit or slot in its wall, and a rotatable valve member housed within the fuel supply member and having an edge which co-acts with the slit or slot, characterised by the fact that said edge and said slit or slot are so fashioned that equal angular movements of the internal valve member open or close, according to the direction of rotation of said internal member, equal portions of the length of the slit or slot, substantially as described.

2. A carburettor for internal combustion engines, according to the preceding claim, in which the tubular outer member has a longitudinal slit or slot and the rotatable inner member is provided with a helical edge which co-acts therewith, substantially as described.

3. A carburettor for internal combustion engines, according to either of the preceding claims, in which the inner rotatable member comprises an outer part on which the helical edge is formed, said part being slotted beyond the inner end of the edge and cut away below said slot to form the helical edge, and providing a passage for the liquid fuel, and an inner part fixed to the outer part and extending below the helical edge to promote the flow of the liquid fuel up the passage to the narrow slit or slot, substantially as described.

4. A carburettor for internal combustion engines, according to claim 1, in which the tubular outer member has a narrow arcuate slit or slot formed at right angles to the longitudinal axis thereof, and in which the inner rotatable member has a straight longitudinal edge which co-acts therewith, substantially as described.

5. A carburettor for internal combustion engines, according to any of the preceding claims, in which adjusting means are provided for setting the edge of the rotatable inner element in the requisite operative position relative to the narrow slit or slot, substantially as described.

6. A carburettor for internal combustion engines, according to claim 5, in which the adjusting means for setting the edge of the rotatable inner element includes a part fixed to said element, a lever adjustably carried by said part, and screw means for adjusting the part relative to the lever, substantially as described.

7. A carburettor for internal combustion engines, according to any of the preceding claims, in which screw means are provided for adjusting the liquid fuel supply controlling means to vary the position of the edge of the inner rotatable element relative to the narrow slit or slot, said means including a lever fixed to the inner element, a screw, a nut engaging the screw, and a part carried by the nut which slidably engages with the lever, substantially as described.

8. A carburettor for internal combustion engines, according to claim 7, in which rotary valves are employed for controlling the supply of air to the carburettor, and for controlling the supply of explosive mixture to the engine, and in which a link is provided for connecting the operating levers of such valves, said link carrying the screw and nut of the adjusting means for the liquid fuel supply controlling device and being adjustably connected thereby to the lever which operates said device, substantially as described.

9. A carburettor for internal combustion engines, according to claim 8, in which screw adjusting means are provided which

co-operate with the lever which operates the air admission valve for setting and adjusting said valve, substantially as described.

10. A carburettor for internal combustion engines according to claim 8, or claim 9, in which the air admission and explosive mixture admission valves are rounded internally so as not to impede the flow of the air and explosive mixture through the carburettor, substantially as described.

11. A carburettor for internal combustion engines, according to any of claims 8 to 10, in which the operating levers for the air admission valve, explosive mixture admission valve, and liquid fuel supply controlling device are connected by the link so that they can be operated by a single control, and in which a stop is provided for limiting the movement of said levers in the one direction, and an adjustable stop is provided for limiting the movement of the levers in the other direction, substantially as described.

12. A carburettor for internal combustion engines, according to any of the preceding claims, in which the body of the carburettor is so constructed that the passage provided therethrough between the inlet for the air and the outlet for the explosive mixture is tapered in opposite directions from the liquid fuel supply controlling device in the direction of the ends, so that said device does not constrict the passage through the body, substantially as described.

13. Carburettors for internal combustion engines, constructed and arranged to operate substantially as hereinbefore described in connection with and as shown in the accompanying drawings.

Dated this 7th day of April, 1931.

WHEATLEY & MACKENZIE,
40, Chancery Lane, London, W.C.2,
Agents.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1931.

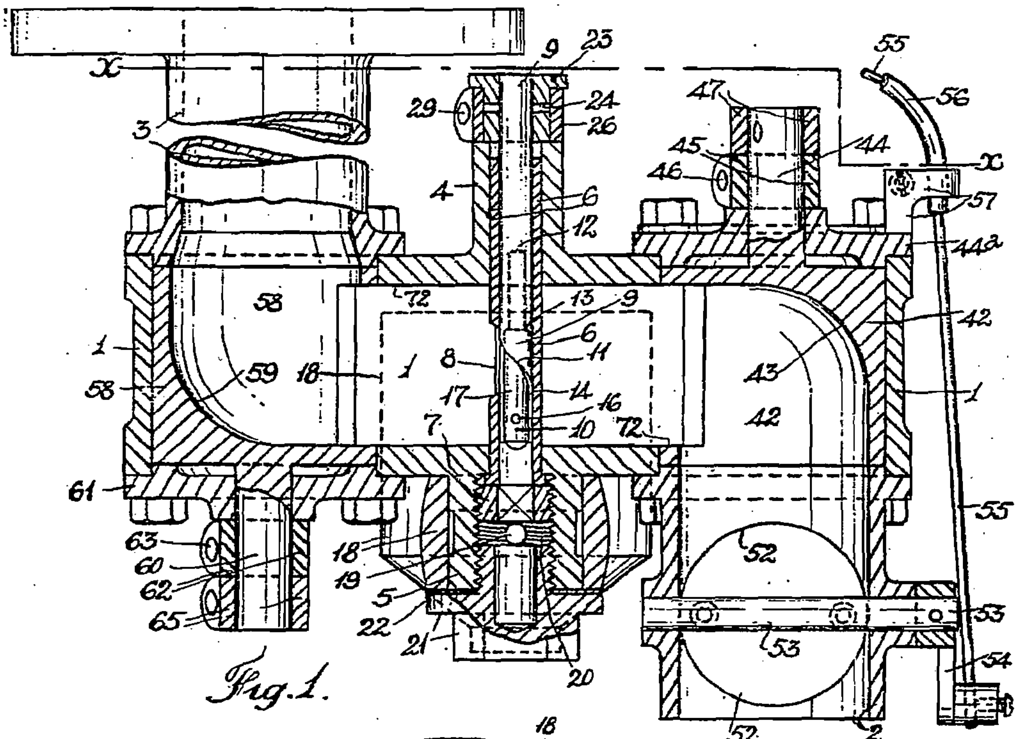

x
9
23
55
56
3
29
24
26
47
44
45
46
4
6
12
x
57
44a
58
72
13
9
6
11
42
1
8
18
59
17
14
16
10
72
43
42
7
61
63
60
62
65
18
19
5
22
21
20
52
53
53
54
52
2
55

Fig. 1.

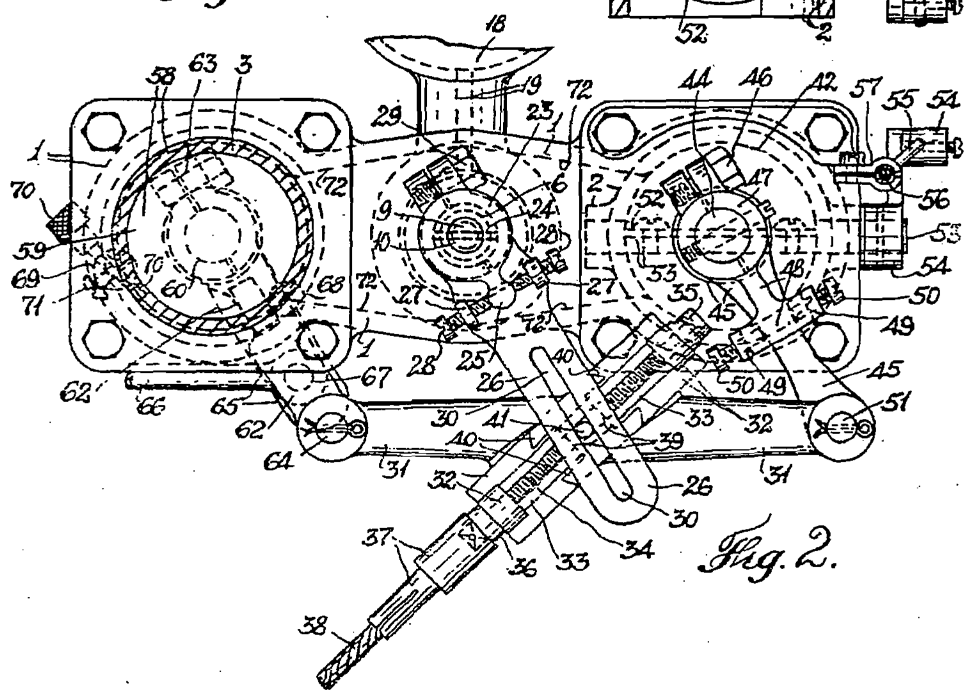
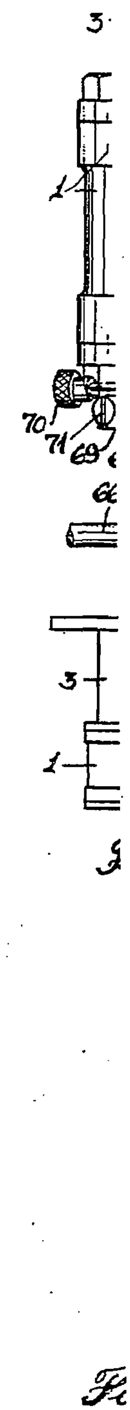
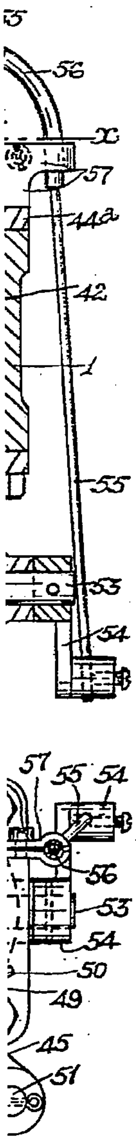

18
19
72
58
63
3
29
23
44
46
42
57
55
54
70
59
69
71
60
68
62
72
9
10
6
24
28
27
27
28
25
26
52
47
53
35
45
48
50
49
67
66
65
62
64
30
41
40
31
32
33
36
37
38
34
26
30
39
33
32
50
49
45
51
31

Fig. 2.


3
1
70
71
69
3
1



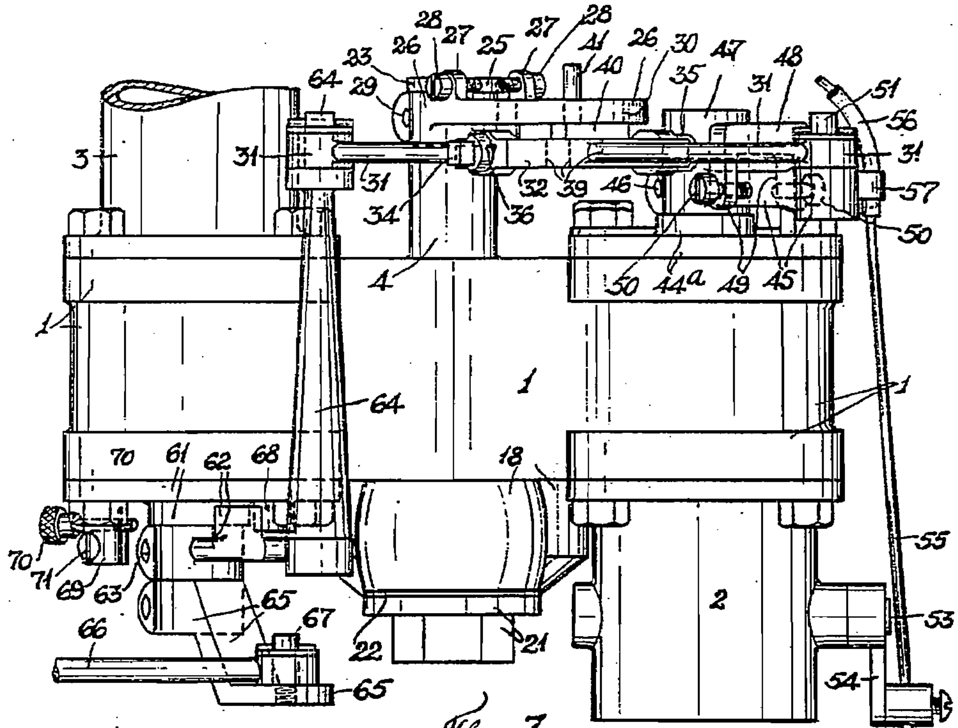


Fig. 3.

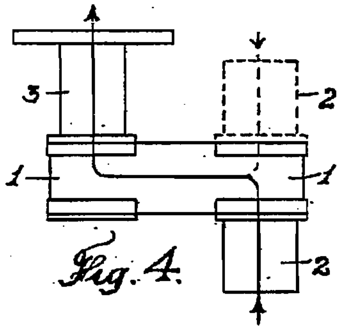


Fig. 4.

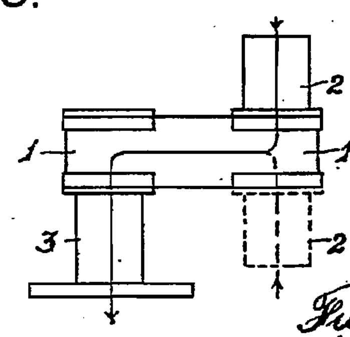


Fig. 5.

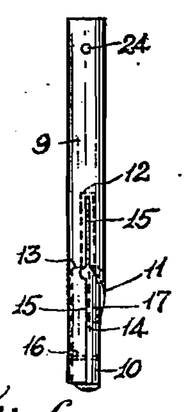


Fig. 6.

Fig. 7.

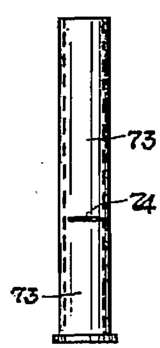


Fig. 8.

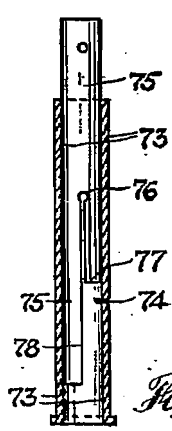


Fig. 9.

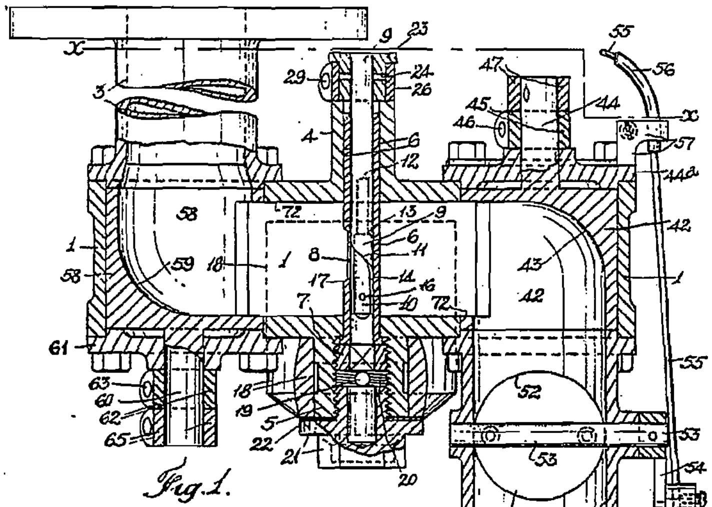


Fig. 1.

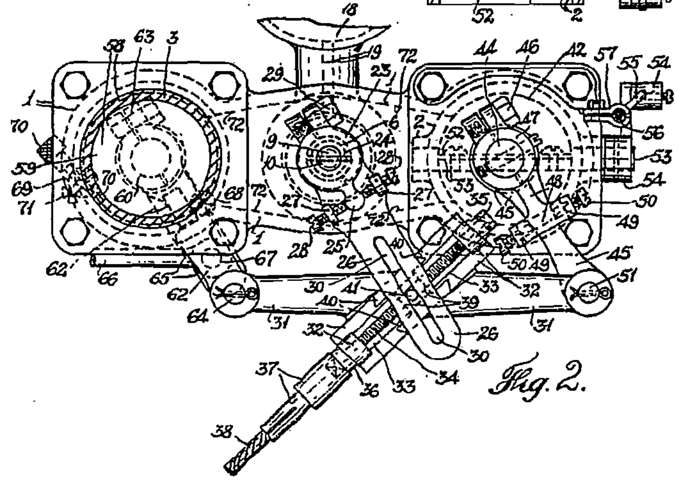


Fig. 2.

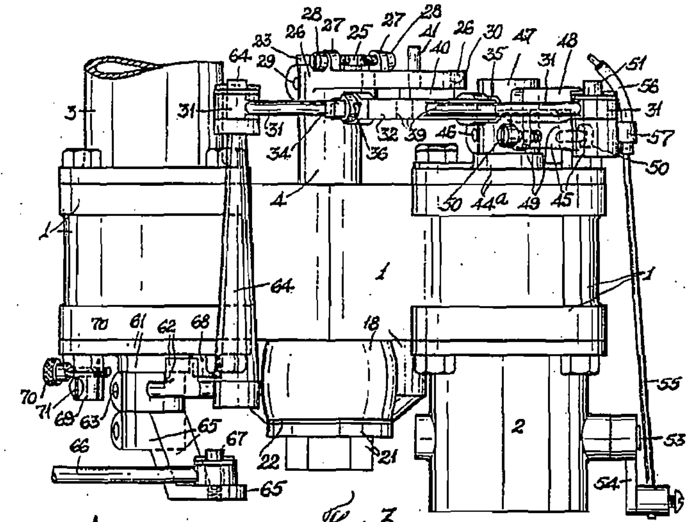


Fig. 3.

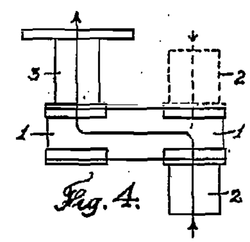


Fig. 4.

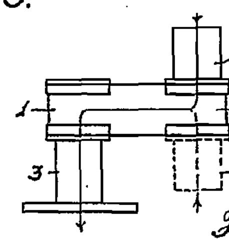


Fig. 5.

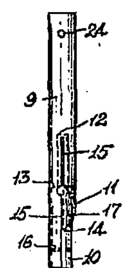


Fig. 6.

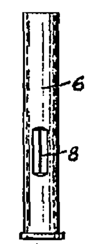


Fig. 7.

Fig. 8.

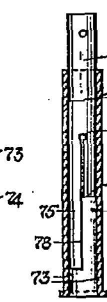


Fig. 9.

[This Drawing is a reproduction of the Original on a reduced scale]

Charles & Read Ltd. Photo Litho.